

1 **REMOTE CONTROL METHOD FOR CONTROLLING**
2 **ELECTRICAL APPLIANCE VIA HOME GATEWAY**

3 **BACKGROUND OF THE INVENTION**

4 1. Field of the Invention

5 The present invention relates to a remote control method, and more particularly to a
6 remote control method for controlling electrical appliance via a home gateway. The
7 method proceeds with an input signal by a telephone call to initiate the main board (the
8 host) to connect to the INTERNET. After registering to the specific DNS server to have
9 the pre-registered IP address, the user is able to control the initiation of household
10 electrical appliances.

11 2. Description of Related Art

12 Automation is currently the synonym of modernization. People try every possible
13 means to make our life easy, simple and more convenient. One approach is to remote
14 control the household electrical appliance. In the early phase, people try to control the
15 appliance by inputting a code through a phone call. Pressing the buttons, digital signals
16 are generated to control the initiation of the appliance. However, while controlling the
17 appliance, the user has to memorize complicated combination of numbers or a series of
18 numbers so as to proceed the control, which is quite complex for the user and not
19 convenient. Recently, another approach is to proceed the control by means of the
20 INTERNET, which includes two different types of control. The first one is similar to the
21 previously conventional method and is accomplished by 56K modem accessing the
22 main board. The second method is accomplished by ADSL broad band that provides a
23 channel to communicate with the main board. The first method has limitations such as
24 the speed of data transmission is low and a telephone line has to be provided during the
25 entire communication. The second method mitigates the speed problem, however, the

1 fixed IP connection tends to generate high controlling cost throughout the process.

2 To overcome the shortcomings, the present invention intends to provide an
3 improved controlling method to mitigate or obviate the aforementioned problems.

4 **SUMMARY OF THE INVENTION**

5 The primary objective of the invention is to provide a method to control the
6 household electrical appliance through the gateway provided in individual house. The
7 connection with the INTERNET is initiated only when a phone call is made to activate
8 the home gateway so that the connection cost is maintained minimum as possible.

9 Another objective of the invention is to provide a home gateway that is able to
10 function as a fax server so as to send/receive faxed data.

11 Still, another objective of the invention is to provide an improved controlling
12 method to activate the household electrical appliance through the power wires indoors
13 so that there is no need to extra installation of transmission media to carry the code to
14 various appliances.

15 Other objects, advantages and novel features of the invention will become more
16 apparent from the following detailed description when taken in conjunction with the
17 accompanying drawings.

18 **BRIEF DESCRIPTION OF THE DRAWINGS**

19 Fig. 1 is a systematic diagram showing the connection between the home gateway
20 with electrical appliances;

21 Fig. 2 is a diagram showing the internal structure of the home gateway;

22 Fig. 3 is a schematic view showing the control of the home gateway to various
23 electrical appliances;

24 Fig. 4 is a schematic view showing the control of the home gateway to various
25 electrical appliances through the power lines;

1 Fig. 5 is a schematic view showing the signal transmission interface with the
2 electrical appliances;

3 Fig. 6 is a schematic view showing the process of code transmission to control the
4 electrical appliances; and

5 Figs. 7 and 8 are applications of the control method through GSM and WAP cellular
6 phone.

7 DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

8 With reference to Fig. 1, the remote control method for controlling electrical
9 appliances via home gateway has a main board (10). The main board (10) provides
10 multiple personal computers (the number for PCs may be up to 253) (30) to access to the
11 INTERNET by means of ADSL. Furthermore, the main board (10) is able to transmit
12 the controlling code (data) to appliances through the power lines (20) so as to activate
13 the appliances. The main board (10) is able to connect to a modem (50) connecting to
14 the phone line so as to connect to a printer, such that the user is able to transmit or
15 receive data through the modem (50).

16 With reference to Fig. 2, the main board (10) has a controller (11) and two
17 INTERNET ports, one is a WAN port (16) to connect to the INTERNET by way of a
18 router (17) to connect to the INTERNET (18) and the other is a hub (15) to provide
19 access to PCs to connect to the INTERNET (18). Two RS 232 ports are provided on the
20 left side of the drawing, one is connected to a power line modem (110) to engage with
21 the household electricity so that the controlling code is able to be carried away by the
22 power line, the other RS 232 is a communication port to connect to a modem connecting
23 port (12). Still, another printing port (14) is connected to a printer to provide a USB
24 connecting port (13) to the USB device.

25 With reference to Figs. 3 to 5, when the method is implemented, first the main

1 board (10) is off-line with the INTERNET (18). When the user makes a call to the
2 modem (50) and access the main board (10) through inputting a predetermined
3 password, the main board (10) will automatically link the INTERNET (18) after the
4 password is verified. When linking the INTERNET (18), the main board (10) will have
5 to register to a specific DSN server to have a pre-registered IP address so that the main
6 board (10) has the IP address available for outside connections. Then, the user is able to
7 use an INTERNET accessible equipment (60), e.g. PC, PDA, Webpad, SMS mobile
8 phone, WAP mobile phone etc., to retrieve the fontpage built in the IP address in the
9 main board (10). The application is shown especially in Figs. 7 and 8, which a GSM
10 mobile phone, a WAP mobile phone or a GPRS mobile phone is able to have access to
11 the INTERNET (18) through the GSM, WAP or GPRS server, so that the user is
12 accessible to individual home gateway and thus controls the appliances.

13 With reference to Fig. 6, the operation procedure of the method comprises the step
14 of data wrapping (66). After the data is wrapped, the data enters a server (62), the main
15 board (10), to proceed the user ID verification and password confirmation step (63).
16 Then a step of electrical appliance confirmation is processed (64). When the subject is
17 confirmed, a controlling code confirmation (65) is proceeded. After the controlling code
18 is confirmed at the previous step, the controlling code is ready for transmission to the
19 output interface, RS 232. As shown in Fig. 4, due to the existed power line in individual
20 house, the controlling code is able to transmit to each of the electrical appliances
21 through the aid of the modem (50) and by way of the power lines. Therefore, there is no
22 need to have extra transmission media to transmit the controlling code, which is quite
23 convenient to the user.

24 With reference to Fig. 5, the power line modem (110) in the main board (10) is able
25 to transform the controlling code to a modem compatible language so that a similar

1 power line modem (71) in the individual appliance (70) is able to communicate with the
2 power line modem (110) in the main board (10). Thereafter, a microprocessor (73) is
3 responsible to process the received signal from the modems (110,71).

4 With the foregoing method, the connection cost to the INTERNET is maintained
5 minimum and the user only needs to memorize the password to access the main board
6 (10) so that the method is a user friendly method and quite convenient in use.

7 Even though numerous characteristics and advantages of the present invention have
8 been set forth in the foregoing description, together with details of the structure and
9 function of the invention, the disclosure is illustrative only, and changes may be made in
10 detail, especially in matters of shape, size, and arrangement of parts within the
11 principles of the invention to the full extent indicated by the broad general meaning of
12 the terms in which the appended claims are expressed.